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EPA Superfund
Record of Decision:

TRI-COUNTY LANDFILL CO./WASTE MANAGEMENT OF ILLINOIS, INC.
EPA ID: ILD048306138
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SOUTH ELGIN, IL
09/30/1992

RECORD OF DECISION

SELECTED REMEDIAL ALTERNATIVE

DECLARATION

SITE NAME AND LOCATION

Tri-County/Elgin Landfill Site
Elgin, Illinois

STATEMENT OF BASIS AND PURPOSE

This decision document presents the United States Environmental Protection Agency's (U.S. EPA) selected remedial action for the TriCounty/Elgin Landfill Superfund Site near Elgin, Illinois. This decision document was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Contingency Plan (NCP). This decision is based on the administrative record file for this site.

The State of Illinois concurs on the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

This remedy is intended to be the final action for the site. This remedy addresses all contaminated media and includes: landfill wastes, contaminated soil and sediment, contaminated ground water, and the emission of landfill gases.

The major components of the selected remedy include:

- Excavation and consolidation of contaminated sediments under the landfill cap;

- Construction of a landfill cover (cap) in compliance with Title 35, Illinois Solid and Special Waste Management Regulations, 807.305 and RCRA Subtitle D cover requirements, as applicable;

- Collection, treatment, and disposal of contaminated ground water;

- Active collection and treatment of landfill gases;

- Comprehensive monitoring program to ensure the effectiveness of the remedy;

- Institutional controls to limit land and groundwater use; and

- Provisions for contingency measures to address changed conditions or previously unknown contamination problems. (eg. migrating contaminant plumes)

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. However, due to the large volume and the heterogenous distribution of waste at the site, treatment as a principle element was not considered practicable at this site. Thus, this remedy does not satisfy the statutory preference for treatment that reduces toxicity, mobility, or volume as a principal element of the remedy. However, treatment is a secondary element of this remedy in that landfill gases and contaminated ground water (if necessary) will be treated, resulting in the destruction of

contaminants.

Because this remedy will result in hazardous substances remaining on-site above health-based levels, a review will be conducted within five years after commencement of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

TRI-COUNTY/ELGIN LANDFILLS
ELGIN, ILLINOIS

I. Site Name, Location, and Description

The Tri-County Landfill/Elgin Superfund Site (TCL) encompasses both the Tri-County and Elgin Landfills. The site is located in northeastern Illinois on the east side of Kane County near the triple junction of Kane, Cook, and DuPage counties (see Figure 1). The Tri-County Landfill consists of approximately 46 acres, and is an inactive landfill located approximately 2/3 of a mile southeast of the Village of South Elgin. The Elgin Landfill (approximately 20 acres) is located immediately adjacent to the northern boundary of the TriCounty Landfill.

On the west and southwest boundaries of the site, the Tri-Countyand Elgin Landfill properties are enclosed by the Prairie Path, which is a former railroad right of way converted into a public bicycle and footpath (see Figure 2). The east and southeast site boundary is bordered by Route 25, along which several commercial businesses are located. The northern property boundary of the Elgin Landfill is bordered by agricultural land.

The land surrounding the Tri-County and Elgin Landfills to the north and to the east is used predominantly for agriculture. The land to the west of the site is occupied by the Woodland Landfill. The Woodland Landfill is an active sanitary landfill which has accepted municipal and selected special wastes since 1976.

Most of the residential properties in the vicinity of the TriCounty and Elgin Landfills are located in the Village of South Elgin, approximately 2/3 of a mile west of the site, west of the Woodland Landfill. The residences nearest the site are located along Dunham and Stearns Roads approximately 1,000 feet southeast of the site. A farm house is located approximately 1,200 feet north of the site. Other residences, most of which are single-family dwellings, are scattered throughout the area surrounding the site. Many of the homes and businesses in the area of the landfills rely on their own private wells to provide drinking water and water for general use.

Surface water features in the area surrounding the site include the Fox River, Brewster Creek, an unnamed tributary to Brewster Creek, and their associated wetlands. The Fox River is located approximately one mile to the west of the site. Brewster Creek is a small, east to west flowing stream located 1/2 of a mile south of the site. The unnamed tributary to Brewster Creek flows toward the site from the east, by-passes the site on the south side, and continues to flow south to discharge into Brewster Creek, which flows west into the Fox River.

II. Site History and Enforcement Activities

The site includes two adjacent landfills, Tri-County Landfill and the Elgin Landfill, respectively. While the two landfills supposedly had separate operations, historical aerial photographs indicate that the two disposal operations overlapped, to the point where the two landfills were indistinguishable.

In May 1971, the Elgin Jaycees, with the support of the Village of South Elgin and village residents, filed a complaint with the Illinois Pollution Control Board (IPCB). This complaint named the Tri-County Landfill Company and Elgin Landfill Company, which owned and operated the adjacent Elgin Landfill, as respondents. The IPCB complaint was initiated because of suspected surface water and ground water contamination.

On April 12, 1973, the IPCB ordered the respondents to "cease and desist the causing of water pollution and the threat of water pollution on their respective sites", and to pay specified penalties and post bonds. State records indicate that several lawsuits and appeals ensued involving both landfills subsequent to the IPCB decision, and that the landfills continued to operate during the pendency of the litigation. Apparently, the landfill owners and operators never fully complied with all of the terms of the decision.

A short history for each landfill is provided below:

Tri-County Landfill

Prior to the 1940's, the Tri-County Landfill site was part of a gravel mining operation. Waste disposal at the Tri-County Landfill reportedly began in April 1968 and continued until December 1976. The Elgin-Wayne Disposal Company had initiated disposal operations at the landfill under a disposal permit issued by Kane County. During the period from 1968 to 1972, operations atthe Tri-County Landfill were managed by the Elgin-Wayne Disposal Company. In 1970, the Tri-County Landfill Company (the actual owner of the property on record) was issued a permit by the Illinois Department of Health to operate the site as a solid waste disposal landfill (Permit 1970-DS-43).

The Tri-County Landfill Company was issued an operational solid waste disposal permit by the Illinois Environmental Protection Agency (IEPA) in 1975 (Permit 1975-24-OP) and a supplemental permit was issued by the IEPA in 1976 (Supplemental Permit 1976/409). However, site operations continued under the management of the Elgin-Wayne Disposal Company until 1976.

The Kane County Building and Zoning Permit, originally issued in 1970, stated that landfilling was to occur in trenches. However, inspection records on file at the IEPA cite open dumping at the landfill and that the "area" method of landfilling was occasionally used. Background data suggests that waste was disposed of directly into the abandoned gravel quarry. Quantities and the specific nature of waste are not well known. Most of the dumping of liquid and industrial waste reportedly occurred at the Tri-County Landfill during the interval from 1968 to 1974. Table 1 is a list of reported wastes and their estimated quantities that were accepted at the Tri-County Landfill. The locations of hazardous waste disposal in the landfill are not known. Typical problems reported at the landfill included: confined dumping, inadequate daily cover, blowing litter, fires, lack of access restrictions, and leachate flows.

Although the landfill operations ceased in December of 1976, the existing cover was not emplaced until early 1981. Correspondence from the IEPA to Waste Management, Inc. on April 14, 1981 indicated that the landfill had been satisfactorily closed and covered. The State did caution Waste Management, Inc. that if problems relating to leachate, surface drainage or erosion were to develop in the future, they should be promptly corrected. Additional correspondence from the State of Illinois to Waste Management, Inc. through the end of 1981 cites erosion, ponding, and leachate problems occurring at the Tri-County Landfill.

Elgin Landfill

Like the Tri-County Landfill, the Elgin Landfill property was the site of a sand and gravel mining business that was operated by the Material Service Company until the late 1950's. Waste disposal operations began in 1961 under the name of the Elgin Landfill Company. No formal method of waste disposal was employed at the site and it appears that irregular areas were excavated, filled with waste and eventually covered. The Elgin Landfill originally operated under a permit issued by Kane County in 1961.

Records detailing the amount and type of waste disposed either do not exist or are not available. Reportedly, primarily brush, residential and commercial rubbish, industrial waste and incinerator ash were disposed of at the landfill from 1961-1976. Table 1 presents a summary of suspected waste streams disposed of into the Elgin Landfill.

III. Highlights of Community Participation

Compliance with the public participation requirements of Section 113 (k)(2)(B)(i-v) of CERCLA/SARA, have been achieved for the TCL site by:

- A press release was issued announcing a public "Remedial Investigation/Feasibility Study (RI/FS) kick-off" meeting to be held to inform the community as to U.S. EPA plans;

- The public "RI/FS kick-off" meeting was held in September 1988, announcing the initiation of the RI/FS;

- A fact sheet was developed and distributed in conjunction with the September 1988 meeting;

- A site information repository was established at the Gail Borden Public Library to allow local access to site-related documents;

- A fact sheet was sent to the community relations mailing list in January 1992, updating them on the progress of the project;

- An Administrative Record has been compiled, including the RI, Baseline Risk Assessment, FS, and other documents, and has been placed in the site information repository;

- A formal advertisement announcing the commencement of the public comment period, the availability of the July 24, 1992, proposed plan, and the time and place of the August 4, 1992, public meeting was placed in the Elgin Daily Courier, a local paper of general circulation;

- The Proposed Plan for remedial action was released for public comment and placed into the Administrative Record on July 24, 1992.

- A thirty (30) day comment period was established and scheduled to end on August 23, 1992;

- A public meeting was held on August 4, 1992, at the South Elgin Village Hall at which U.S. EPA and IEPA presented the Proposed Plan to the community and received verbal comments. A transcript was kept of the public meeting and was made available to the public and placed in the Administrative Record and site repositories;

- A fact sheet was developed and distributed in conjunction with the August 4, 1992 meeting.

- U.S. EPA granted a thirty (30) day extension of the public comment period on August 18, 1992, extending the closing date to September 22, 1992;

- A fact sheet highlighting corrections to the Baseline Risk Assessment and extension of the public comment period was mailed in August to the persons listed in the Community Relations mailing list;

- An advertisement was placed in the local newspaper on August 18, 1992, announcing the extension of the public comment period to September 22, 1992;

- U.S. EPA has received oral and written comments regarding the RI/FS, Baseline Risk Assessment, and the Proposed Plan. Significant comments have been addressed in the attached Responsiveness Summary.

IV. Scope of the Selected Remedy

The selected remedy is a source control remedial alternative to be implemented at the TCL site (Tri-County and Elgin Landfills), encompassing all currently identified areas of concern at the site. The principal threats identified at the site are considered to be ground water contamination, contaminated soil, sediments and gas generated from the landfill waste materials. In order to mitigate the threat to human health and the environment, the selected remedy addresses the site as a continuing source of ground water contamination.

The selected remedy will also include additional investigations and studies to assist in the design of the remedial action, to verify hydrogeological and other conditions noted in the RI, to assess and mitigate impacts of remediation activities on the environment and potential wetlands, to assess the nature and extent of any off-site contaminant migration, and to evaluate the need for and type of responses to off-site contamination which may need to be implemented as part of the remedy.

V. Summary of Site Characteristics - Remedial Investigation

The RI was initially implemented to characterize the nature and extent of contamination at the Tri-County Landfill. Results from the initial RI fieldwork identified contaminated ground water in the northwest portion of the Tri-County Landfill. Based on the preliminary information, it appeared that the adjacent Elgin Landfill may be contributing to ground water impacts. Therefore, it was necessary to expand the RI to include an investigation of the adjacent Elgin Landfill. Specific RI field activities include the following:

. Surface geophysical investigation and evaluation of the Tri-County Landfill

. Landfill cap investigation and evaluation

. Geologic investigation and evaluation

. Hydrogeologic investigation and evaluation

. Ground water use survey

- Soil sampling and analysis
- Ground water sampling and analysis
- Surface water and sediment sampling and analysis
- Selective test pit sampling and analysis.

The discussion below summarizes the results from the investigation of both the Tri-County and Elgin landfills.

Hydrogeology and Hydrology

Ground water occurrence at the site is divided into three distinct hydrogeologic units: a shallow ground water zone, an intermediate ground water zone, and a deep bedrock aquifer (See Figure 3). The elevation of water levels in monitoring wells screened at different depths indicate that there generally is a downward hydraulic gradient at the site. The ground water occurrence and flow characteristics suggest that there is a hydraulic connection between the shallow and intermediate ground water, and between the intermediate ground water and deep aquifer. U.S. EPA file documentation also supports these interconnections.

The shallow ground water occurs at various locations within the upper sand and gravel unit, perched on top of the middle till unit. The occurrence and flow of the shallow ground water is not consistent throughout the upper aquifer, and is dependant on surface water run-off which is retained in depressions scattered on the site, the irregular surface topography of the underlying middle till unit, the existence of the Woodlands Landfill facility, including the vertical clay seal and any other components, and the possible existence of higher permeability zones within the upper unit. In much of the landfilled area, the shallow ground water is in direct contact with landfill waste.

In the southern part of the site, the shallow ground water generally appears to flow toward the south-southwest. In the north, its flow direction apparently varies from west to north. However, due to the complexity of the structure of the upper unit and the middle till, specific flow directions may vary at different locations throughout the site.

Intermediate ground water occurs within the lower till unit and is semi-confined beneath the middle till unit. The primary flow direction of intermediate ground water is toward the southwest.

The deep aquifer occurs within the first bedrock unit encountered beneath the site. The flow direction of the deep ground water, based on elevation data collected in August 1989, is toward the southwest. Deep ground water elevation data collected in November 1990 and February 1991 indicate a westerly direction of flow. De-watering activities associated with the construction of the Woodland Landfill appears to have at least temporarily altered the flow direction of the deep ground water in the vicinity of the site.

Surface water features in the area surrounding the site include the Fox River, Brewster Creek, a tributary to Brewster Creek, and their associated wetlands-type areas. On-site surface water features include several small apparent wetlands that have developed in surface depressions. A somewhat larger, partially forested wetland-type area is located in the southern portion of the site south of the landfilled area. A leachate-filled ditch is located along side the Prairie Path near the south end of the site.

Municipal, Commercial, and Residential Water Use Survey

The Village of South Elgin and the Community of Valley View obtain water from municipal wells installed in the thick sequences of outwash sands and gravels contained in the Newark Valley. The municipal wells serving the Village of South Elgin are located approximately 2/3 of a mile west and northwest of the site. The Valley View Wells are located approximately 2 miles southwest of the site.

Almost all of the residents and businesses south and southwest of the site have their own private wells. These wells are primarily installed in either outwash sands and gravels or bedrock. The outwash sands and gravels correspond to the shallow and intermediate ground water zones beneath the site. The bedrock corresponds to the deep aquifer at the site. Several businesses which rely on their own wells to supply water are located on-site. The residences nearest the site are located approximately 1,000 feet southeast and approximately 1,200 feet north of the site.

Extent of Contamination

Soils

Volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and inorganic analytes were detected above background concentrations in Tri-County and Elgin Landfill surface and subsurface soils. Pesticides were present above background concentrations in Elgin Landfill surface, subsurface, and test pit soils. Elgin Landfill test pit soils contained PCBs.

Ground Water

The shallow ground water zone beneath and adjacent to the site has been impacted by commingled contaminants from both landfills. VOCs, SVOCs, pesticides, inorganic analytes and general water quality parameters were detected above background concentrations in shallow ground water. Concentrations of vinyl chloride, benzene, trichloroethene, 1,2-dichloroethene, tetrachloroethene, arsenic, fluoride, lead, and mercury exceed their established drinking water standards (MCLs) or action levels in the shallow ground water samples. Three compounds (vinyl chloride, trichloroethene, and benzene) were detected off-site in wells located at the Woodland landfill above established MCLs. Various inorganic analytes (iron, manganese, chloride, and total dissolved solids (TDS)) were also detected off-site above background concentrations, however, none were detected above any established MCLs.

Impact to the intermediate ground water zone by VOCs, SVOCs, pesticides, inorganic analytes, and general water quality parameters has occurred on-site. Several compounds, including vinyl chloride, benzene, chromium, and lead were present at concentrations exceeding their established MCLs, or action levels, in intermediate on-site ground water samples. No organic compounds were detected off-site above established MCLs. Again, several inorganic analytes (barium, iron, chloride, and TDS) were detected off-site above background concentrations but below any established MCLs.

Concentrations of VOCs, SVOCs, inorganic analytes, and general water quality parameters were detected above background in the deep aquifer and the private/public wells sampled. No MCLs were exceeded in the deep monitoring wells installed for the RI. Chromium was present above the established MCL in one on-site private business well installed through the Elgin landfill. Lead was detected above the established action level in one off-site private business well and one private residential well. No organic or inorganic compounds were detected off-site above established MCLs in the bedrock aquifer.

Surface Water and Sediment

SVOC impact is present in surface water and VOC impact is present in sediment collected from downstream unnamed tributary locations. Neither pesticides nor PCBs were detected in surface water. PCBs were detected in sediments collected from a small depression in the Tri-County Landfill cap and from the Elgin Landfill pond. Pesticides were also detected in Elgin Landfill pond sediments.

Inorganic compound contamination was most evident in surface water and sediments collected from a ditch containing leachate on the southern portion of the site and in the Elgin Landfill pond. Arsenic was detected above background concentrations in downstream unnamed tributary sediments.

Air

During fieldwork activities, it was documented that the landfill was venting gas. Several times during installation of monitoring wells through the landfill, installation had to be halted because of gas venting from the borehole. At the time of the field investigation, appropriate gas sampling procedures had not been established and gas sampling equipment was not available. Therefore no chemical samples were taken of the gas. Based on ambient air field screening equipment, the gas appeared to be mostly methane. Methane is a common gas generated by most landfills.

VI. Summary of Site Risks

Because the Tri-County Landfill and the Elgin Landfill have accepted a variety of wastes, numerous chemicals have been detected at the site. Following the RI, an analysis was conducted to estimate the potential health or environmental problems that could result if the site was not cleaned up. This analysis is referred to as the Baseline Risk Assessment (RA). In this assessment, approximately 166 contaminants representing essentially all classes of chemicals including: inorganic, volatile and semi-volatile organic, pesticides, polychlorinated biphenyls (PCBs), and polynuclear aromatic hydrocarbons (PAHs) were

evaluated for carrying through the risk assessment. Of these,71 contaminants were retained from these chemical classes for use in assessing site risks. These chemicals can be found on Table 2-8 of the Baseline RA report.

Those contaminants contributing the most significantly to current and future site risks included: VOCs such as vinyl chloride, benzene, trichloroethene, and 2-butanone; various SVOCs such as benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene; pesticides such as 4,4'-DDT; PCBs, specifically Aroclor 1242 and Aroclor 1254; and inorganics such as arsenic, beryllium, chromium, nickel, antimony, barium, cobalt, thallium, and manganese. Specific information can be found in Tables 5-1 through 5-30 of the Baseline RA report.

The most highly contaminated media included the site-wide surface soils and ground water. Lower levels of contamination were found in the surface water and sediments.

The two landfills contain a variety of industrial and municipal waste. Ground water monitoring wells located within and around the landfills indicate that contaminants from both landfills are commingled and are sources of ground water contamination. Leachate is created at this site when rain water or melting snow percolates through the waste of the landfills. Leachate is either discharged through seeps or is intermixed with the local ground water. One major leachate seep has been identified and is in the southern portion of the site. The seep discharges into a ditch which eventually flows into the unnamed tributary of Brewster Creek. Samples from the leachate ditch indicates it has been significantly impacted
by inorganic contamination, which is a typical characteristic of landfill leachate.

The RI investigation documented widespread contamination in most media. The RI did not identify any hotspots or distinct sources.

The potential migration pathways for these contaminants include leaching from the soils or waste material to the ground water, movement of contaminated ground water to surface water and sediments, volatilization of chemicals to air from water and soils, and migration of contaminated surface soils as particulates in the air. Evidence of contaminants potentially leaving the site through ground water migration includes the detection of benzene, vinyl chloride, trichloroethene, and some inorganic analytes at low levels located across the Prairie Path in monitoring wells on the Woodland Landfill property. The only off-site routes of migration for surface water and surface water sediments are through the southern portion of the site, which eventually drains into the unnamed tributary of Brewster Creek. The leachate seeps and ground water discharges into the southern portion of the site appear to originate from within the buried waste of the landfills and clearly indicate a pathway for off-site migration of contaminants.

The Baseline RA evaluated the risk of exposure at the site taking into account current uses of the site, as well as the potential future uses (Both occupational and residential exposures). The potential future uses assumes that the site and/or directly adjacent properties would continue commercial operations as well as potential being developed for residential purposes. The Baseline RA showed that there are ten potential routes of current and future exposure which consist of the following:

1) Ingestion of contaminated soils,
2) Direct dermal contact with contaminated soils,
3) Ingestion of contaminated ground water,
4) Dermal contact with contaminated ground water during showering,
5) Inhalation of volatile contaminants from ground water during showering,
6) Ingestion of contaminated surface water,
7) Dermal contact with contaminated surface water,
8) Ingestion of contaminated sediment,
9) Dermal contact with contaminated sediment, and
10) Inhalation of volatilized contaminants and contaminated particulates.

Risks at Superfund sites are typically assessed with respect to both carcinogenic and noncarcinogenic adverse effects of a chemical under current and future exposure scenarios. The current and potentially exposed populations are occupational workers at or near the site, residents living on or near the site, and persons who may recreate on the Prairie Path or on the site itself. Cancer risks from various exposure pathways are assumed to be additive.

The Baseline RA showed that the site poses unacceptable risks to the public health. Unacceptable risks are those that may result in one additional cancer case in 10,000 to 1,000,000 people exposed over a lifetime. The primary routes of exposure which contribute unacceptable risks are future ingestion of contaminated

ground water by occupational and residential receptors (approximately 2 additional cancer cases in 1000), dermal exposure to contaminants in ground water during showering by future residential receptors (approximately 11/2 additional cancer cases in 1000), and current and future inhalation of contaminated fugitive dust and volatile emissions by occupational, residential, and recreational receptors (approximately 21/3 additional cancer cases cases in 10,000). In many cases of exposure, it is likely a person would be exposed to the site contamination through more than one exposure route. In these cases, the risks levels of the exposure routes are added together resulting in higher risks due to combined exposures to site contaminants.

All of the risks are determined by exposure models. These models utilize very conservative assumptions to indicate worst case exposure scenarios.

The noncarcinogenic risks are evaluated with respect to a hazard quotient, which is the ratio of the level of exposure to an acceptable level. If the hazard quotient for an exposed individual or group exceeds 1.0 for a particular chemical, there may be noncarcinogenic health effects resulting from the exposure to that chemical. If the hazard index, which is the sum of the hazard quotients for all chemicals in a particular medium, exceeds 1.0 there may be a concern for potential health effects from exposure to that medium. The Baseline RA showed that the hazard indices at the site exceeded 1.0, suggesting that both current and future exposures to chemicals of concern on the site may result in excess noncarcinogenic risks to all populations. Two of the exposure routes (Ingestion of ground water and Dermal contact with groundwater during showering) had hazard indices greater than 1.0. One exposure route (Ingestion of ground water) had individual hazard quotients for individual contaminants greater than 1.0. As with the carcinogenic risks, two or more routes of exposure may be complete for a person exposed to the site contamination. In these cases, the hazard index for each case would be added together resulting in a combined hazard index greater than 1.0.

In conclusion, the Baseline RA documents that releases of hazardous substances from this site, if not addressed by the remedy, present an imminent and substantial endangerment to public health, welfare, and the environment.

Ecological impacts from site related contamination were also evaluated. Surveys of flora and fauna populations were taken in a qualitative attempt to assess adverse impacts. These findings established some impacts to the local ecosystem. The impact was generally associated with elevated levels of zinc and mercury above established Ambient Water Quality Criterion in the surface water. The Baseline RA concluded that all of the remedialalternatives considered in the FS, except the "No Action" alternative, addressing the risks to public health would address the ecological impacts as well.

VII. Rationale for Action

The U.S. EPA considers several sources of information in determining whether or not to take action at a site. Based on the data gathered in the RI, the U.S. EPA performs a risk assessment to determine if adverse health conditions, current or potential future conditions, threaten human health and/or the environment. The U.S. EPA also evaluates the site conditions in relation to Federal and State environmental statutes and policies, in addition to the statutory mandates promulgated in CERCLA and the goals and expectations identified in the NCP. The primary criteria with respect to the Tri-County and Elgin landfills are presented below.

A. Risk Summary

Total lifetime excess carcinogenic risk and total hazard indices by media and for the entire site are estimated to be:

Contaminated Media	Current Use CR	Current Use HI	Future Use CR	Future Use HI
Site Wide Soils	6.0 x 10[-4]	0.28	5.1 x 10[-4]	0.76
Ground Water	1.7 x 10[-4]	14	3.4 x 10[-3]	150
On-site SW	1.7 x 10[-6]	0.2	1.7 x 10[-6]	0.2
On-site Sediment	9.5 x 10[-6]	0.075	9.5 x 10[-6]	0.075
Tributary SW	2.5 x 10[-6]	1.5	2.5 x 10[-6]	1.5
Tributary Sediment	1.6 x 10[-4]	0.25	1.6 x 10[-4]	0.25
Air Inhalation	4.6 x 10[-5]	0.054	3.6 x 10[-4]	0.36
Site Totals	9.9 x 10[-4]	16.36	4.4 x 10[-3]	153.1

CR = Carcinogenic Risk
HI = Hazard Index

The relative contribution to the total site risks and total hazard indices from each media are summarized as follows:

Contaminated Media	Current Land Use CR	Current Land Use HI	Future Land Use CR	Future Land Use HI
Site Wide Soils	60.6 %	1.7 %	11.6 %	0.5 %
Ground Water	17.2 %	85.6 %	77.3 %	98.0 %
On-site SW	0.2 %	1.2 %	0.04 %	0.1 %
On-site Sediment	1.0 %	0.5 %	0.2 %	0.05 %
Tributary SW	0.3 %	9.2 %	0.06 %	0.98 %
Tributary Sediment	16.2 %	1.5 %	3.6 %	0.2 %
Air Inhalation	4.6 %	0.3 %	8.2 %	0.2 %

CR = Carcinogenic Risk
HI = Hazard Index

The potential risks at the site exceed the acceptable risk range of 1 x 10[-4] to 1 x 10[-6], and thus present unacceptable current and potential future risks to human health.

The total hazard index for the site is estimated to be 16.36 currently, and 153.1 for potential future use. Individual media resulted in hazard indices as great as 14 currently and 150 for potential future use of the site. Individual contaminants of concern resulted in hazard indices as high as 12 for current use and 82 for potential future use of the site. U.S. EPA considers HI's greater than 1 to be an unacceptable risk.

B. Environmental Standards Exceeded at the Site

In addition to posing unacceptable risks to receptors, the TCL site does not meet certain applicable or relevant and appropriate Federal or State environmental standards (ARARs) at this time.

1. Cap

The existing landfill cap does not meet the substantive requirements of Title 35, Illinois Solid and Special Waste Management Regulations, 807.305, for final cover. These provisions have been determined to be ARARs for the site.

2. Ground water

The shallow ground water zone contains levels of volatile organics and metals exceeding or violating ARARs, including State ground water quality standards and Federal drinking water standards.

C. Summary

Actual and threatened releases of hazardous substances are occurring from this site. If not addressed, these releases may present an imminent and substantial endangerment to public health, welfare or the environment. Thus, it is necessary that corrective and mitigative action be taken to address the threats posed by the actual or threatened releases.

The RI and Baseline RA conducted for the site established that there are unacceptable risks associated with the contaminated ground water, surface soils, and sediments as well as a problem of venting landfill gas. The source of the risks originate from commingled contaminants within and emanating from both landfills.

Since the wastes contained in and emanating from both landfills are co-mingled and both landfills have resulted in a combined impact to the environment, both landfills are being treated as one site for the purpose of remediation. Therefore, the site is defined as including both the Tri-County Landfill, the Elgin Landfill, and adjacent impacted areas for purposes of the remedial design and remedial action.

The response action to be taken will be designed to address known unacceptable risks associated with the site. The response action would address: 1) the contaminated ground water currently migrating into adjacent lowlying areas, surface waters, soils, sediments, as well as off-site, 2) the contaminated sediments located in the leachate ditch, 3) the contaminated surface soils which create an inhalation risk, 4) treat or control the emissions of landfill gases, and 5) cover and close both landfills in accordance with established applicable State and Federal laws and regulations.

VIII. Description of Alternatives

Based on the results of the RI, a list of alternatives was assembled to address the site remedial action objectives and ensure compliance with the requirements of the NCP. These alternatives are presented in the Feasibility Study prepared for the TCL site. The alternatives include those which would provide no action (as statutorily required), waste containment, and/or waste treatment. Since the site has contaminated soil, ground water, sediments, landfill wastes, and landfill gases which need to be addressed, alternatives are developed for each contaminated medium. This was done to simplify the evaluation between the different alternatives. However, since an alternative for one contaminated medium may affect the other contaminated media, selecting the final response action for the site was also based on the best overall combination among the different alternatives.

The following remedial alternatives were developed for the site, and are briefly described below.

ALTERNATIVE ONE: NO ACTION

Alternative One is the No Action Alternative and serves as a basis to which all other alternatives can be compared. Under this remedial alternative, no active remedial action or institutional action would be taken regarding the site. According to the National Contingency Plan (NCP), the No Action Alternative must be carried through to the detailed analysis of alternatives.

Estimated Capital Cost:	$	0
Estimated Annual O&M Cost:	$	0
Estimated Present Worth:	$	0
Estimated Time to Implement		none

SOIL AND WASTE MATERIAL ALTERNATIVES

These alternatives address the containment of impacted soils and waste material on-site. Containment would be achieved by capping. Two types of capping systems are proposed: a clay cap, and a multilayer cap. These alternatives will also provide protection of ground water by limiting the infiltration of precipitation into the waste material and will prevent the uncontrolled emission of landfill gas from the site. Institutional controls to restrict access, use, and development of the site would be included in each of the alternatives. Fencing would be used to control access to the site and to protect the cap from unauthorized human activities.

Alternative SW-1: Containment of Soils and Waste via Capping of the Site with a Clay Cap

Containment of the soils and waste material would consist of capping and surface water diversion. Surface water diversion would be achieved by regrading the site to eliminate depressions where precipitation currently accumulates. A 24 inch clay cap would then be installed to conform with applicable regulations for closure of general refuse solid waste facilities (35 Ill. Adm. Code 807 and RCRA Subtitle D). An 8-inch

topsoil layer would be placed over the clay to support vegetation and stabilize the cap, minimizing erosion. Section 3.4.1 of the FS contains a detailed description of the capping system.

Estimated Capital Cost:	$ 6,400,000
Estimated Annual O&M Cost:	$ 6,500
Estimated Present Worth:	$ 6,500,000
Estimated Time to Implement:	2 years

Alternative SW-2: Containment of Soils and Waste via Capping of the Site with a Multilayer Cap

Containment of the soils and waste material under this alternative would also consist of surface water diversion and capping. Surface water diversion would be achieved by regrading the site to eliminate depressions where precipitation is currently accumulating. A multilayer cap would then be installed to conform with applicable regulations for closure of chemical and putrescible waste facilities (35 I11. Adm. Code 811 and RCRA Subtitle C). The cap would consist of a 36-inch clay layer and an 18-inch sand drainage layer; an 18inch topsoil layer would be placed over the drainage layer to support vegetation and to stabilize the cap and minimize erosion. Section 3.4.1 of the FS contains a detailed description of the capping system and Figure 3.2 of the FS shows a cross-section of this system.

Estimated Capital Cost:	$ 12,500,000
Estimated Annual O&M Cost:	$ 6,500
Estimated Present Worth:	$ 12,600,000
Estimated Time to Implement:	2 years

GROUND WATER AND LEACHATE ALTERNATIVES

All of the alternatives include a ground water and leachate collection system. The collected ground water and leachate would be discharged to surface water or the public owned treatment works (POTW). It is unknown at this time whether the recovered ground water and leachate would require treatment prior to discharge. Recovered ground water would be analyzed during the Remedial Design phase of the project to determine the necessity of treatment. Treatment of recovered ground water may consist of variety of processes. These processes and their applicability are discussed in the FS.

All of the ground water alternatives with the exception of the No Action Alternative include a ground water collection system.

Regardless of which ground water alternative is selected, a ground water monitoring system will be established to monitor the effectiveness of the remedy being implemented. Also, a monitoring well network will be designed as an early warning system to detect contamination migrating downgradient of the operating Woodland Landfill, to be located upgradient of the residential area located west of Gilbert Street.

Alternative GW-1: Containment and Collection of On-Site Ground Water and Leachate via Interceptor Trenches

Under this alternative ground water and leachate would be collected using interceptor trenches. The interceptor trenches would be constructed along the north, northwest, and southwest borders of the landfills. Interceptor trenches would consist of drainage pipe placed 30 to 40 feet below grade, on top of the silty clay layer. The drainage pipe would be surrounded by approximately two feet of peastone gravel. The size of the drainage pipe will vary depending on the area where the interceptor trench is located.
The intercepted ground water and leachate would be conveyed through the drainage pipe to a collection sump. A pump in the collection sump would transfer the collected water to a common lift station through a transmission pipe. An average rate of approximately 100 gallons per minute of ground water and leachate would be collected by this system. From the lift station, the collected ground water and leachate would be transferred to the surface water discharge location or the POTW.

Estimated Capital Cost:	$ 1,600,000
Estimated Annual O&M Cost:	$ 87,000
Estimated Present Worth:	$ 3,000,000
Estimated Time to Implement:	2 years

Alternative GW-2: Containment and Collection of On-Site and Off Site Ground Water and Leachate via Interceptor Trenches

This alternative is similar to Alternative GW-1 with the exception that an additional interceptor trench

would be constructed adjacent to the northwestern corner of the site on the Woodland Landfill property. The location of this trench would allow for impacted ground water located northwest of the Elgin Landfill to be collected. It has been assumed that the flow rate for this system would be approximately the same as that of Alternative GW-1. Although this alternative may produce slightly more water, the quantity is not anticipated to be significant (10%) from a conceptual design standpoint and will not greatly affect the accuracy of cost for the collection, transport, and treatment systems.

Estimated Capital Cost:	$ 1,700,000
Estimated Annual O&M Cost:	$ 88,000
Estimated Present Worth:	$ 3,100,000
Estimated Time to Implement:	2 years

Alternative GW-3: Containment of Ground Water with a Slurry Wall; Collection of Leachate Using Cistern Wells

Under this alternative a slurry wall would be constructed around approximately 50% of the site to prevent ground water from flowing into the site. The slurry wall would be composed of a soil/bentonite mixture. Off-site soils would probably have to be used in order to meet the specified requirements for such mixtures. Sand and gravel are specified for these mixtures. The slurry wall would be keyed into the silty clay layer which is located approximately 30 to 40 feet below the current grade of the site. Cistern wells would be installed in the landfill to collect leachate and ground water from within the landfill.

It has been estimated that 50 gallons per minute of leachate would be collected by this system. Each well would have a submersible pump with a level control system. The level control system will turn the pump on and off and maintain the ground water table depression in the area of the well, inducing a hydraulic gradient to the well. The flow rate is expected to decrease after approximately six months as the landfills become dewatered. From the lift station, the collected ground water and leachate would be transferred to the surface water discharge location or the POTW.

Estimated Capital Cost:	$ 4,100,000
Estimated Annual O&M Cost:	$ 87,000
Estimated Present Worth:	$ 5,500,000
Estimated Time to Implement:	2 years

LANDFILL GAS AND AMBIENT AIR ALTERNATIVES

The RI had documented that the landfills are releasing significant amounts of landfill gas. Regardless of which alternatives are selected for the other media, it is obvious that the release of the landfill gas has to be controlled to protect the recreational users of the Prairie Path and employees at the commercial businesses located on or near the landfill. It is not known what chemical contaminants are contained in the gas. However, based on the limited data from the ambient air field screening equipment, the gas appears to be mostly methane. Two alternatives were developed in the FS to control the release of landfill gas and are described below.

Alternative LG-1: Collection of Landfill Gas Using an Active Gas Collection System and On-Site Treatment

This system would consist of a series of gas extraction wells connected to a blower/flaring facility by a series of ducts. The blower would create a vacuum within the extraction well and landfill gas would be conveyed to the flaring facility. The landfill gas would then be passed through a condensate tank to remove moisture. The landfill gas would then be treated by flaring and discharged to the atmosphere.

Estimated Capital Cost:	$ 610,000
Estimated Annual O&M Cost:	$ 150,000
Estimated Present Worth:	$ 3,100,000
Estimated Time to Implement:	2 years

Alternative LG-2: Collection of Landfill Gas Using a Passive Gas Collection System.

A passive system would be a combination of both venting wells and a trench vent. The venting wells were assumed to have the same arrangement as the extraction wells for the active system. It was assumed that no ducting or blower/flare facility would be required, thus, this system may not meet air pollution control requirements. A trench vent would be placed along the western edge of the building on the Tri-County and Elgin Landfills. The trench vents would consists of thirty-five foot deep trenches backfilled with gravel. A synthetic membrane would be used to line the side of the trench opposite the landfill, this would help to

prevent migration of gas past the trench. Vent pipes would be placed every one hundred feet along the trench to allow gas to be vented to the atmosphere.

Estimated Capital Cost:	$ 1,000,000
Estimated Annual O&M Cost:	$ 17,000
Estimated Present Worth:	$ 1,300,000
Estimated Time to Implement:	2 years

Surface Water and Sediments Alternatives

It is anticipated that the surface water bodies on the Tri-County and Elgin Landfills would be drained as part of any of the soils and waste material action alternatives which include grading and capping. These surface water bodies were formed as a result of the landfill settling. These areas are topographic lows which collect precipitation and surface run-off from the higher areas of the landfill. The total volume of surface water is relatively low, therefore, on-site treatment was screened out of the analysis as cost prohibitive. Therefore, all alternatives contain off-site treatment for the surface water.

The sediments associated with the surface water bodies also contain low levels of contamination. However, since these sediments are located on top of the landfill, any capping remedy would contain the contamination below the cap.

The contaminated sediments located in the leachate ditch on the southern portion of the site do represent an unacceptable risk. Since any capping remedy would not contain this contamination, these sediments have to be addressed. These sediments would be excavated and consolidated on-site prior to capping or disposed at an appropriate off-site facility.

With any action taken at the site, the drummed drill cuttings generated during the RI activities will have to be addressed. These drums are currently stored on-site in a secured area. The drill cuttings would be handled the same as the contaminated sediments during the remedial action.

Alternative SS-1: Collection and Off-Site Treatment of Surface Water, and Consolidation and Containment of Sediments On-Site

Estimated Capital Cost:	$ 24,000
Estimated Annual O&M Cost:	$ 0
Estimated Present Worth:	$ 0
Estimated Time to Implement:	6 months

Alternative SS-2: Collection and Off-Site Treatment of Surface Water and Consolidation and Containment of Sediments Off-Site

Estimated Capital Cost:	$ 34,000
Estimated Annual O&M Cost:	$ 0
Estimated Present Worth:	$ 0
Estimated Time to Implement:	6 months

IX. Evaluation of Alternatives

The NCP requires that the alternatives be evaluated against nine evaluation criteria. This section summarizes the relative performance of the alternatives by highlighting the key differences among the alternatives in relation to these criteria. The nine evaluation criteria which are categorized as: (1) Threshold Criteria; (2) Primary Balancing Criteria; and(3) Modifying Criteria. Each of these terms is described as follows:

. Threshold Criteria

- 1) Overall protection of human health and the environment addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced or controlled through treatment and engineering controls. The selected remedy must meet this criteria.

- 2) Compliance with applicable or relevant and appropriate requirements (ARARs) addresses whether a remedy will meet federal and state environmental laws and/or justifies a waiver from such requirements. The selected remedy must meet this criteria or waiver of the ARAR must be obtained.

. Primary Balancing Criteria

- 3) Long-term effectiveness and permanence refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

- 4) Reduction of toxicity, mobility, and volume through treatment is the anticipated performance of the treatment technologies a remedy may employ.

- 5) Short-term effectiveness addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed, until cleanup goals are achieved.

- 6) Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

- 7) Cost includes estimated capital and operation and maintenance (O&M) costs, also expressed as net present-worth cost.

. Modifying Criteria

- 8) Support Agency (IEPA) acceptance reflects aspects of the preferred alternative and other alternatives the IEPA favor or object to, and any specific comments regarding federal and state ARARs or the proposed use of waivers.

- 9) Community acceptance summarizes the public's general response to the alternatives described in the proposed plan and in the RI/FS, based on public comments received.

A detailed discussion of the evaluation of the alternatives against the nine criteria has been provided in the FS. The alternatives are grouped according to the corresponding contaminated medium. The NCP requires that the"No Action" alternative be evaluated to establish a baseline against which all other alternatives are measured. A summary of the evaluation discussion is provided below.

No Action Alternative

Based upon the detailed analysis, it was concluded that Alternative One - No Action, would not satisfy the criterion of ensuring the overall protection of human health and the environment. The Baseline RA has documented unacceptable risks present at the site and Alternative One does not meet this criterion because no remedial action would be taken to address the present and future uses of the site and contaminant migration from the site.

Compliance with ARARs does not apply for a "No Action" remedy. ARARs only apply when actions are taken at a site to address risks to human health or the environment.

Since Alternative One does not satisfy a Threshold Criterion, no further evaluation against the Primary Balancing or Modifying criteria is needed. Alternative One will not be chosen for the site.

Inter-relationship of Remedies for the Different Media

Selection of a remedy for the soil and waste may affect the selection of a remedy for the ground water and leachate. After the analysis of the alternatives, the best overall combination of remedies for the different media need to be selected.

It is assumed that one of the soil and waste alternatives for capping would be chosen along with any ground water remedy. The various combinations would have differing impacts. Therefore, when selecting the overall site remedy, the impacts of the remedies on different media need to be taken into account. For example, if the intent is to dewater the landfill, the multilayer cap would be chosen over the single layer cap since it would be more effective in preventing infiltration. On the other hand, if ground water would be collected as it migrates off-site and the landfill is not dewatered, then there is little reason to select the multilayer cap.

Threshold Criteria

1) Overall Protection of Human Health and the Environment

SOIL AND WASTE MATERIAL ALTERNATIVES

Alternative SW-1: This alternative would be protective by reducing the amount of precipitation which percolates through the cap and thereby, reduce the amount of leachate that is produced. Also, the cap would eliminate the greatest risk due to inhalation of contaminated particulates by eliminating the route of exposure.

Alternative SW-2: This alternative would be slightly more protective than SW-1 since a multilayer cap would be more effective in limiting infiltration of precipitation into the landfill.

GROUND WATER AND LEACHATE ALTERNATIVES

Alternative GW-1: This alternative would be protective by preventing further degradation of the local aquifers by collecting the contaminated ground water as it leaves the site. Collected ground water would be treated, if necessary, prior to surface water discharge or discharge to the POTW. However, this alternative would not address the contaminated ground water located off-site. It is anticipated that the generally low levels of contamination in the off-site ground water would decline below ground water compliance levels within a short period of time after the known contaminant source is contained.

Alternative GW-2 This alternative would be slightly more protective than GW-1 since the off-site contaminated ground water would be collected. Since, at this site, the levels of off-site groundwater contaminants appear to be only slightly above acceptable levels, it is thought that collection of the impacted off-site ground water is not significantly more protective than GW-1.

Alternative GW-3 This alternative would be as protective as GW-1 but may not be as protective as GW-2. With the installation of a slurry wall, there would be a permanent horizontal barrier to severely reduce the amount of uncontaminated ground water from flowing into the site area preventing additional contaminated ground water from migrating offsite. The slurry wall combined with cistern wells would practically dewater the landfill and prevent direct contact with the wastes, thereby reducing the potential of significant release to the ground water. By dewatering the landfill, GW-3 would also be more protective of the lower aquifers by preventing further degradation by significantly reducing any downward gradient.

LANDFILL GAS AND AMBIENT AIR ALTERNATIVES

Alternative LG-1: This alternative would be protective by installing an active gas collection system and treating the gas by flaring prior to its release to the atmosphere. LG-1 is more protective than LG-2 since the collected gas is treated prior to its release.

Alternative LG-2: This alternative would be protective by installing a passive gas collection system, thereby controlling the release of gas generated by the landfills. The trench vents would prevent the horizontal migration of gas, addressing the potential problems of the adjacent businesses. This alternative would also prevent the gas generated by the landfill from breaching any cap selected for landfill.

SURFACE WATER AND SEDIMENTS ALTERNATIVES

Alternative SS-1: This alternative would be protective by collecting and treating the standing surface water on the landfill, and also containing the contaminated sediments onsite underneath the cap. This alternative would prevent the contaminated sediments from becoming airborne particulates.

Alternative SS-2: This alternative is as protective as SS-1, with the exception that the contaminated sediments would be transported to an off-site disposal facility. This transportation may increase the risks of accidents due to increased traffic around the site. If an accident should occur, risks to the surrounding population would be increased.

2) Compliance with ARARs

SOIL AND WASTE MATERIAL ALTERNATIVES

Alternative SW-1: This alternative would comply with all chemical, action, and location specific ARARs.

Alternative SW-2: This alternative would comply with all chemical, action, and location specific ARARs.

GROUND WATER AND LEACHATE ALTERNATIVES

Alternative GW-1: This alternative would comply with all action and location specific ARARs. Chemical specific ARARs would be met with the exception of the off-site contaminated ground water. However, it is expected that chemical specific ARARs would be met within a short period of time through natural attenuation once the source is addressed.

Alternative GW-2: This alternative would comply with all chemical, action, and location specific ARARs.

Alternative GW-3: This alternative would comply with all action and location specific ARARs. For chemical specific ARARs, this alternative is the same as GW-1.

LANDFILL GAS AND AMBIENT AIR ALTERNATIVES

Alternative LG-1: This alternative would comply with all chemical, action and location specific ARARs for air emissions.

Alternative LG-2: Since this alternative does not involve treatment, LG-2 may not comply with ARARs for air emissions. The quality of the landfill gas would need to be determined during RD.

SURFACE WATER AND SEDIMENTS ALTERNATIVES

Both SS-1 and SS-2 would comply with chemical, action, and location specific ARARs.

Primary Balancing Criteria

3) Long-term effectiveness and permanence

SOIL AND WASTE MATERIAL ALTERNATIVES

Capping the landfill would contain the surface soils and wastes effectively. A cap would permanently reduce infiltration into the landfill. SW-2 would provide a more effective barrier to preventing infiltration than SW-1. However, since the waste mass is in contact with groundwater, the more effective infiltration reduction achieved by SW-2 over SW-1 is not felt to be significant. This is due to the fact that contaminants will continue to be transferred from the waste mass to groundwater, regardless of the type of cap.

GROUND WATER AND LEACHATE ALTERNATIVES

All three alternatives would be effective in preventing off-site migration of contaminated ground water. GW-2 would be more effective than GW-1 and GW -3 by collecting off-site contaminated ground water. GW-3 would be the most effective in preventing off-site migration since a slurry wall would provide a permanent horizontal barrier and the landfill would be dewatered, thereby reducing the amount of leachate generated by the landfill.

LANDFILL GAS AND AMBIENT AIR ALTERNATIVES

Both LG-1 and LG-2 would be effective in controlling horizontal migration of landfill gas. LG-1 would be more effective than LG-2 since the gas would be actively collected to a central area and then treated prior to being released to the atmosphere. However, LG-1 would require yearly maintenance to ensure long term effectiveness.

SURFACE WATER AND SEDIMENTS ALTERNATIVES

Both alternatives would be effective for addressing the surface water and sediments.

4) Reduction of toxicity, mobility, and volume

SOIL AND WASTE MATERIAL ALTERNATIVES

Neither alternative would reduce toxicity or volume of the wastes since both are containment alternatives. However, both would reduce the mobility of the contaminants by preventing infiltration. SW-2 would reduce mobility slightly more than SW-1 by preventing less infiltration.

GROUND WATER AND LEACHATE ALTERNATIVES

All three alternatives would reduce the mobility of the contaminants. It is unknown at this time whether treatment of the water is required. Therefore, at this time, none of these remedies would reduce the toxicity or volume of contaminants. GW-3 would reduce the mobility of the contaminants the most by reducing the amount of leachate generated. GW-2 would reduce the mobility of the off-site contamination.

LANDFILL GAS AND AMBIENT AIR ALTERNATIVES

Both LG-1 and LG-2 would be effective in controlling the mobility of the landfill gas. LG-1 would reduce the toxicity and volume of contaminants by treatment of the gas prior to its release to the atmosphere. LG-2 would not reduce the toxicity or volume of the gas. LG-1 would result in the destruction of contaminants.

SURFACE WATER AND SEDIMENTS ALTERNATIVES

Both SS-1 and SS-2 would reduce the mobility of the contaminants by containment. Neither would reduce the toxicity or volume of the contaminants.

5) Short-term Effectiveness and 6) Implementability

SOIL AND WASTE MATERIAL ALTERNATIVES

Both alternatives would be effective in the short-term by providing measures to protect workers and the local community. SW-2 would result in increased truck traffic which would increase the potential for traffic accidents.

Both alternatives can be readily implemented.

GROUND WATER AND LEACHATE ALTERNATIVES

All three alternatives would be effective in the short-term by providing measures to protect workers and the local community. GW-3 would result in significantly increased truck traffic which would increase the potential for traffic accidents.

All three alternatives can be readily implemented. However, GW-1 and GW-2 would present slightly greater construction difficulties due to the size and depth of the trench required. GW-2 may be less implementable than GW-1 because of the potential interference with the operations of the adjacent Woodland Landfill.

LANDFILL GAS AND AMBIENT AIR ALTERNATIVES

Both LG-1 and LG-2 may result in uncontrolled landfill gas emissions during construction activities. Uncontrolled emissions would be greater for LG-2, resulting from the construction of the trench vents.

Both LG-1 and LG-2 are readily implementable. LG-2 would result in the most difficulties due to the construction of the trench vents.

SURFACE WATER AND SEDIMENTS ALTERNATIVES

Both SS-1 and SS-2 would reduce the mobility of the contaminants by containment. Neither would reduce the toxicity or volume of the contaminants.

7) Cost

Specific details regarding the costs of the remedies are available in the FS. Also, the cost summary for each alternative has been presented in Section VIII of this Proposed Plan.

SOIL AND WASTE MATERIAL ALTERNATIVES

The costs associated with SW-2 are approximately twice the costs associated with SW-1. The increase is due solely to the multi-layer cap versus the single layer cap. The O&M costs are the same for both alternatives.

GROUND WATER AND LEACHATE ALTERNATIVES

The costs for alternatives GW-1 and GW-2 are approximately the same. GW-3 is approximately $ 2,500,000 more than either GW-1 or GW-2. The O&M costs for the three alternatives are similar.

LANDFILL GAS AND AMBIENT AIR ALTERNATIVES

The costs for the two alternatives vary greatly. Capital costs for LG-1 ($ 610,000) are approximately 1/2 of the capital costs for LG-2 ($1,000,000). These costs are associated mainly with the installation of the trench vents for LG-2. However, the O&M costs of LG-1 ($ 150,000/year) are almost ten times the O&M costs for LG-2 ($ 17,000/year). The total cost for LG-1, assuming 30 years of operation, are approximately twice the total costs for LG-2. However, if the O&M costs for LG-1 could be reduced by 50%, the costs for LG-1 and LG-2 are within $ 500,000. One option to note, O & M costs may be able to reduced significantly by generating electricity from the operation of the flares and utilize it to run the blower.

SURFACE WATER AND SEDIMENTS ALTERNATIVES

The costs of SS-1 and SS-2 are essentially the same, with a $10,000 savings for on-site consolidation. No O&M costs are associated with either alternative.

X. The Selected Remedy

The U.S. EPA and IEPA have conducted an analysis of the potential remedies and have developed a remedial action plan for the site. The remedy, is a combination of alternatives developed for the various contaminated media (See Figures 4, 5, and 6). The components of the remedy provided below.

Soil and Waste Material Preferred Alternative	SW-1
Ground Water and Leachate Preferred Alternative	GW-1
Landfill Gas and Ambient Air Alternative	LG-1
Surface Water and Sediments Alternative	SS-1

The selected remedy includes a wetlands assessment to specifically delineate the actual extent of wetlands (including the presence of any state or federal endangered species), a study of potential impacts on wetlands by the remedy, and a program to mitigate, replace and/or restore wetlands which are impacted by the remedy in compliance with Executive Order 11990 for protection of wetlands.

The remedy will include draining the standing surface water on the landfills and a small portion of the standing water in the low lying area on the southern portion of the site. This water will be used as dust control within the landfills during remediation activities or transported and treated off-site. The contaminated sediments in the drainage ditch will be excavated until local background concentrations are met, as determined by U.S. EPA. The contaminated sediments and the drummed drill cuttings stored on-site will be consolidated within the landfill area prior to construction of the cap.

The landfill cap will be constructed of a minimum of 24 inches of low permeability clay overlain with a minimum of 8 inches of topsoil to support vegetation. Precipitation run-off will be drained to the low area on the southern portion of the site to compensate for the loss of ground water discharge to the area. The cap would comply with substantive requirements of Title 35, Illinois Solid and Special Waste Management Regulations, 807.305, for final cover, as applicable. Additionally, the constructed cap will comply with RCRA Subtitle D landfill cover requirements, as applicable.

The remedy will also include a hydrogeological study to further delineate the interrelationship between the Woodland Landfill property, the site, the underlying aquifers, and ground water contamination. This study will provide the information needed

to, among other things, determine the optimal placement of the monitoring wells downgradient of the Woodland Landfill and the ground water and leachate collection trenches. This study will also attempt to verify if the active Woodland Landfill is also adversely impacting the ground water.

A ground water and leachate collection system will be installed to collect contaminated ground water as it leaves the landfills. The purpose of the system is to prevent migration of contaminated groundwater to nearby low lying areas, surface waters, soils, sediments and off-site groundwater. The system is also intended to prevent migration of contaminated ground water from the upper to the intermediate aquifer.

The need for treatment of the collected ground water prior to discharge is not known at this time. This information would be determined during the RD phase of the project. However, since it is probable that the contaminated ground water will need some sort of treatment prior to surface water discharge, provisions will be included for discharging the contaminated ground water to the local POTW. This may require the construction of a transmission pipe to transfer the water to the sanitary sewer system of South Elgin. It is anticipated that a lift station would be need to be upgraded in order to handle the increase water flow from the site. It may be possible that the water may need some limited form of pre-treatment prior to discharge to the POTW. This will be determined during RD and, if necessary, a treatment system would be constructed on-site to meet any required discharge standards established by the POTW. Provisions will also be made for discharge to surface waters or other disposal methods, in accordance with applicable laws and regulations, in the event acceptance by the POTW is not obtained.

The specific design details and parameters of the selected groundwater collection system shall include consideration of the results of the pre-design and design investigations which will be conducted to further define the complex site hydrogeology and extent of contamination related to the site. U.S. EPA may set schedules for installation of the selected groundwater collection system which allow for phased or delayed installation of the system. Furthermore, U.S. EPA may consider replacing the selected component with an alternative remedial groundwater component, in the event U.S. EPA determines, based on pre-design and design investigations and available information, that the selected groundwater collection system is

not appropriate for site conditions, or that another groundwater approach would be equally or more protective than that selected and is warranted. Any such alteration would be made in compliance with CERCLA procedures, including provisions for issuance of an Explanation of Significant Difference or a ROD amendment, as applicable.

Regardless of final design, the collection system will be operated to contain the leachate and contaminated groundwater. The collection system will be operated until such time that U.S. EPA determines that the leachate/ground water beneath the site no longer poses a threat to human health and the environment. If U.S. EPA approves shut-down of the system, the ground water will be, at a minimum, monitored quarterly to document that the leachate/ground water beneath the site meet ARARs or other appropriate health-based concentrations, as determined by U.S. EPA. If the contaminant levels in leachate/ground water beneath the site exceed acceptable levels, the collection system shall be re-activated.

Contaminated ground water located off-site (adjacent to the northwest portion of the site) will not be collected even though it is contaminated above MCLs. Since the levels of contamination in the off-site ground water are relatively low and near MCLs and health based levels, and since the effectiveness of off-site collection appears to be limited by the irregular topography of the clay layer and the location, design, and activities of the Woodland Landfill, an off-site collection system is not believed to be an effective approach at this time. It is expected that the relatively low levels will naturally attenuate in a short period of time, as designated by U.S. EPA (e.g. approximately 5 years) once the remedy is implemented and the contaminant source is cutoff.

However, if predesign studies indicate that such a system may be feasible, or if the levels of off-site contamination do not appear to be approaching the ground water compliance levels at a satisfactory rate, or are increasing, this decision will be reevaluated.

Additionally, the remedy will include contaminant fate and transport modeling based on existing and newly-generated data to assist U.S. EPA in determining if a satisfactory attenuation rate is being achieved and to evaluate potential off-site contaminant impacts.

Impacts to nearby media, including surface water, soils and sediments, especially those in the southern portion of the site, will also be addressed by the groundwater collection system. The trenches will intercept contaminated groundwater flowing from the waste mass into lower-lying areas, thus preventing the transfer of contaminants from the waste mass, through the groundwater, into off-site groundwater and other media.

A monitoring program will be established to monitor the effectiveness of the remedy and to provide assurance that the local residential and public wells are not being adversely impacted by contaminated ground water from the site. The system will include, at a minimum, sampling of existing monitoring wells, installation of new monitoring wells at needed locations, and ground water sampling and monitoring of potentially affected public/private drinking water wells. Monitoring of soils, sediments and surface water will also be established to assess the effectiveness of the remedy with regard to these media, as determined by U.S. EPA.

The monitoring well system will include installation of monitoring wells downgradient of the operating Woodland Landfill and upgradient of the any potential residential areas. This system will be designed to be an early warning system for detection of migrating groundwater contamination before it would impact the residential wells. The details of the monitoring system will be determined during the design of the remedy based on the results of the hydrogeological studies, and other available information.

The point-of-compliance for groundwater compliance standards shall be adjacent to the Site perimeter, as measured through a series of U.S. EPA designated monitoring wells. The point of compliance shall include EPA designated monitoring wells within the groundwater immediately adjacent to the northwestern corner of the site where slight exceedances of MCLs were previously detected.

Groundwater compliance standards must be met at all times at all monitoring wells at and beyond the point-of-compliance, with the exception of the contaminated groundwater located adjacent to the northwest corner of the site, unless otherwise provided by EPA. For this area, based on contaminant fate and transport modelling and other available information, EPA shall designate a time period (to begin after completion of construction of the remedial action) during which the exceedances detected therein will be allowed to naturally attenuate down to groundwater compliance standards.

If it is indicated that contaminant levels (including those in the low-lying southern portion of the site) are not being reduced by containing the source of the contamination, or if they are seen to be increasing, or

if contaminants are migrating further downgradient from the site (e.g. towards or past the Woodland Landfill property), or if ground water compliance standards are exceeded in any well at or beyond the point-of-compliance (including, after expiration of the time period to be set by EPA, monitoring wells within the area adjacent to the northwest corner of the site), or if other off-site impacts are not being mitigated at or beyond the point of compliance, further remedial action may be taken in accordance with CERCLA, possibly including a downgradient ground water collection system. Contingency provisions for any additional remedial activities will be included in the design plans.

The emission of landfill gas will be controlled by an active collection system. The gas will be collected by extraction wells connected to a blower facility. The gas would pass through a condensate tank to remove moisture, and would then be treated on-site by flaring prior to being discharged to the atmosphere. The emission of the treated landfill gas will comply with the substantive requirements of Part 811 (Title 35 Ill. Adm. Code) for control of landfill gas, as applicable. The flaring system will be operated in compliance with National Primary and Secondary Ambient Air Quality Standards (NAAQS) and National Emission Standards for Hazardous Air Pollutants (NESHAPs).

The remedy would also include institutional controls as appropriate such as deed restrictions, and a ground water monitoring program. Deed restrictions or other appropriate controls will be established to prevent future development or installation of drinking water wells.

The remedy will also include a program to assess whether all offsite impacts (e.g. in the downstream unnamed tributary and other areas, including the low -lying areas in the southern portion of the site) from the landfills are being mitigated by the remedy. The remedy will also include further investigation to ascertain the location and nature of any other sources of contamination in the vicinity of the site.

The remedy will require installation of a site-perimeter fence and provision of site security during remedial construction. The fence would restrict access preventing trespassing on the site which may jeopardize the integrity of the cap.

Finally, the design of the remedy will consider the impact of the remedy on the businesses which are located within, and adjacent to, the site perimeter.

The combined cost of this remedy is estimated below:

Estimated Capital Costs:	$	8,634,000
Estimated Annual O&M Cost:	$	243,500
Total Present Worth:	$	12,624,000
Estimated Time to Implement:		2 - 3 years

The U.S. EPA, in consultation with IEPA, has determined that the selected alternative is the best balance of desirable characteristics among the alternatives with respect to the nine criteria. Based on information available at this time, the U.S.EPA and IEPA believe the preferred alternative offers the best protection of human health and the environment, complies with ARARs, eliminates long-term risks, reduces toxicity, mobility or volume to the extent practicable, is implementable and is cost effective. By cutting off leachate discharges to the southern portion of the site, the sediment and the surface water quality will be improved, benefitting the local environment.

XI. Statutory Determinations

The selected remedy must satisfy the requirements of Section 121 of CERCLA to:

A. Protect human health and the environment;
B. Comply with ARARs;
C. Be cost-effective;
D. Utilize permanent solutions and alternate treatment technologies to the maximum extent practicable; and
E. Satisfy the preference for treatment as a principle element of the remedy.

The implementation of the selected remedy at the TCL site satisfies the requirements of CERCLA as detailed below:

A. Protection of Human Health and the Environment

Implementation of the selected remedy will reduce and control potential risks to human health posed by

exposure to contaminated ground water, soil, landfill waste, landfill gases, surface water, and sediments. The selected remedy will reduce potential exposure to contaminated ground water to within acceptable risks of 1 x 10[-4] to 1 x 10[-6] excess cancer risk and a Hazard Index of less than 1.0. The selected remedy also protects the environment from the potential risks posed by site chemicals discharging to ground water, the unnamed tributary of Brewster Creek, surrounding soils, sediments, and potential wetlands.

Institutional controls will be implemented to protect against drinking of contaminated ground water at the site.

Capping the landfill, in addition to reducing the potential risk posed by exposure to landfill contaminants, will reduce precipitation infiltration through the cap. Ground water contaminant loading would then be reduced.

Gas extraction and destruction will reduce the volume of contaminants in the landfill waste and will reduce current and potential risks due to the landfill gases.

Excavation and consolidation, under the landfill cap, of contaminated sediments will reduce the excess cancer risk due to exposure to soil and sediments to within acceptable risks of 1 x 10[-4] to 1 x 10[-6] excess cancer risk and a Hazard Index of less than 1.0.

No unacceptable short-term risks will be caused by implementation of the remedy. The nearby community, and site workers, may be exposed to noise and dust nuisances during construction. Standard safety measures should manage any short-term risks. Dust control measures would mitigate risks as well. Mitigative measures will be taken to prevent and address adverse environmental impacts.

B. Compliance with ARARs

With respect to any hazardous substances, pollutants or contaminants that will remain on-site, CERCLA (121 (2)(A)) requires the U.S. EPA to select a remedial action which complies with legally applicable or relevant and appropriate standards, requirements, criteria or limitations (ARARs). The selected remedy will comply with Federal ARARs or State ARARs where State ARARs are more stringent, as determined by U.S. EPA. The remedy will be implemented in compliance with applicable provisions of CERCLA and the NCP.

1. Chemical-Specific ARARs

Chemical-specific ARARs regulate the release to the environment of specific substances having certain chemical characteristics. Chemical specific ARARs typically define the extent of cleanup at a site.

a. Soils/Sediments

There are no chemical-specific standards established for soils and sediments. However, risk-based levels or local background concentrations may be utilized in establishing chemical-specific cleanup goals for soils and sediments and are factors "to-be-considered" in designing a protective remedy for this site.

b. Ground Water

i). Federal ARARs

Maximum Contaminant Levels (MCLs), and to a certain extent, Maximum Contaminant Level Goals (MCLGs), the Federal drinking water standards promulgated under the Safe Drinking Water Act (SWDA), are ARARs for the site. MCLGs are relevant and appropriate when the standard is set at a level greater than zero (noncarcinogens), otherwise MCLs are relevant and appropriate.

ii). State ARARs

The State of Illinois is authorized to administer the implementation of the Federal SDWA. The State has also ground water quality standards promulgated under Title 35, Subtitle F, Chapter I, Part 620. These state ground waterquality standards are ARARs for the ground water at the TCL site.

c. Surface Water

i). Federal ARARs

CERCLA Section 121(d)(2)(B)(i) requires the U.S. EPA to consider whether water quality criteria for human health and aquatic life protection developed under the Clean Water Act (CWA) Section 304 would be relevant and appropriate considering the designated or potential use of ground water or surface water, the environmental media affected, the purposes for which such criteria were developed, and the latest information available.

Federal water quality criteria (WQC) are guidelines that set pollutant concentration limits to protect surface waters that are applicable to point source discharges, such as from industrial or municipal wastewater streams. At a Superfund site, the Federal WQC would not be applicable except for pretreatment requirements for discharge of treated water to a Publicly Operated Treatment Works (POTW). Since the selected remedy plans to discharge to the local POTW, these requirements are applicable for the TCL site. The AWQCs for protection of freshwater aquatic organisms are relevant and appropriate to the TCL site remedy for any direct discharges to the unnamed tributary, Brewster Creek, or the Fox River.

ii). State ARARs

The State of Illinois has been authorized to implement the National Pollutant Discharge Elimination System (NPDES) established under the CWA. For any discharge to waters of the State of Illinois, the chemical specific standards of Title 35, Subtitle C, Subpart B, Section 302.208 and toxic substances standards of Section 302.210 of the Illinois Administrative Code establishing General Use Water Quality Standards would be ARARs.

2. Location Specific ARARs

Location-specific ARARs are those requirements that relate to the geographical position of a site. These include:

a. Federal ARARs

Executive Order 11990 - Protection of Wetlands is an ARAR for any remedial action taken within wetlands. This ARAR requires that activities required in a wetland must minimize the destruction, loss, or degradation of the wetland. In addition, any affected wetlands may be restored, as appropriate.

Endangered Species Act (16 USC 1531) - The Endangered Species Act requires that actions must be performed to conserve the endangered or threatened species located in and around the TCL site. Activities must not destroy or adversely modify the critical habitat upon which endangered species depend. The selected remedy will be implemented in compliance with this regulation. Prior to conducting remedial activities, a survey of the subject areas will be conducted to determine whether or not endangered or threatened species will be affected.

b. State ARARs

Endangered Species Protection Act, Title 17 Conservation Chapter 1, Subchapter C, Part 1075 Illinois Administrative Rules - Under this requirement, actions must be performed to conserve the endangered or threatened species located in and around the TCL site. Activities must not destroy or adversely modify the critical habitat upon which endangered species depend. The selected remedy will be implemented in compliance with this regulation. Prior to conducting remedial activities, a survey of the subject areas will be conducted to determine whether or not endangered or threatened species will be affected.

3. Action Specific ARARs

Action-specific ARARs are requirements that define acceptable treatment and disposal procedures for hazardous substances.

It is unknown at this time whether or not the collected ground water will require treatment prior to discharge to the POTW or a surface water body. If required, any treatment system utilized will be operated in compliance with ARARs.

a. Federal ARARs

RCRA Subtitle D establishes requirements for final cover and gas control from solid waste landfills. The selected remedy will comply with these ARARs, as applicable. In this case, since the waste mass is in contact with groundwater, a subtitle D cap was selected rather than a Subtitle C cap, since the more

effective infiltration reduction achieved a "C" cap over a "D" cap is not felt to be significant. This is due to the fact that contaminants will continue to be transferred from the waste mass to groundwater, regardless of the type of cap.

New Federal Regulations for solid waste landfills were promulgated in the Federal Register of October 9, 1991. These regulations pertain to minimum cover requirements for caps constructed after October 9, 1993 and post closure care. Post closure care includes maintenance of the cap, ground water monitoring, leachate collection, and quarterly monitoring of methane gas concentrations. Post closure care must be conducted for a period of 30 years. These remedy will be implemented in compliance with these requirements as specified in 40 CFR Part 258, Subpart F.

The new Federal Regulations for solid waste landfills as specified in 40 CFR 258.23 for explosive gas controls would be relevant and appropriate to the active landfill gas extraction and treatment. These requirements establish maximum methane concentrations in facility structures and property boundary as well as establishing a methane monitoring program. The remedy will be implemented in compliance with these requirements.

Land Disposal Restrictions ("LDR" or "Land Ban") would not be applicable because no placement of RCRA hazardous wastes will occur and no listed wastes are documented at the site. The contaminated sediments excavated and reconsolidated within the landfill will be tested to determine if they are RCRA characteristic by the TCLP test. If they are determined to be characteristic, the sediments will be stabilized prior to be consolidated within the landfill.

Federal Clean Air Act - This act authorized the establishment of National Primary and Secondary Ambient Air Quality Standards (NAAQS) for air pollutants (40 CFR Part 50) and National Emission Standards for Hazardous Air Pollutants (NESHAPs) (40 CFR Part 61). Also under 40 CFR 60.18, new source performance requirements are established for solid waste landfills. Compliance with these standards will be met during excavation and landfill gas flaring activities.

b. State ARARs

The State of Illinois is authorized to implement the Subtitle D solid waste requirements of RCRA. The selected remedy will comply with substantive requirements of Title 35, Illinois Solid and Special Waste Management Regulations, Section 807, Subpart C for closure of solid wastes landfills, specifically relating to final cover (minimum of 24 inches of suitable material), air pollution, and closure requirements, as applicable.

C. Cost Effectiveness

Cost effectiveness is determined by evaluating the following three of the five balancing criteria to determine overall effectiveness: long-term effectiveness and permanence, reduction of toxicity, mobility or volume through treatment, and short-term effectiveness. Overall effectiveness is then compared to cost to ensure that the remedy is cost effective.

The selected remedy provides overall cost effectiveness because it provides adequate long-term effectiveness and permanence. Secondary reduction in toxicity, mobility, and volume is accomplished through treatment of the ground water and landfill gases. No unacceptable short-term risks will be caused by implementation of the remedy.

D. Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

The selected remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable ("MEP"). This finding was made after evaluation of the protective and ARAR-compliant alternatives for the TCL site remedial action and comparison of the "trade-offs" (advantages vs. disadvantages) among the remedial alternatives with respect to the five balancing criteria (see discussion above).

E. Preference for Treatment as a Principle Element

The principle threats at the TCL site are the contaminated ground water and contaminated soil and landfill waste. The selected remedy uses treatment as a secondary element of the remedy through: 1) collection and treatment of leachate and contaminated groundwater as it leaves the landfills, and 2) extraction and treatment of landfill gases. As previously noted, treatment of the landfill waste is considered technically impracticable.